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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Processing of DTV Maximization Applications
MM Docket No. 87-268

Dear Ms. Salas:

On behalf of Fox Television Stations, Inc. (Fox), this letter is written to follow up on a meeting held Wednesday, November 10, 1999, among Peggy Binzel, Andy Setos, Evans Wetmore and Maureen O'Connell of Fox and staff members of the Mass Media Bureau identified below to discuss various aspects of the processing of digital television (DTV) maximization applications. At this meeting, Commission staff invited Fox to offer suggestions to facilitate the efficient processing of DTV maximization applications.

Technical Issues

As demonstrated below and in the attached Memorandum from R. Evans Wetmore, P.E., Vice President, Advanced Engineering, News Technology Group, the Commission should clarify that DTV maximization applications and subsequently filed analog and digital minor modification applications will be processed and granted on a "first come/first served" basis. The attached Memorandum responding to specific technical issues raised at the meeting demonstrates that a "first come/first served" processing methodology is the only feasible method for dealing with complex issues of spectrum management and thus conserves scarce Commission resources. The Memorandum also offers clarification on the following:

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- Applications for maximization of DTV service area should be evaluated for potential interference based on the state of spectrum utilization as of the date of filing the application.
- The protected contour should be defined as the Frequency Adjusted Service (for DTV) or Grade B contour (for NTSC) per OET Bulletin No. 69 as set forth in the Table of Allotments. The protected contour of a television station does not expand with a power or height increase.
- Mutually exclusive DTV maximization applications should be evaluated simultaneously because often the increased power of both stations will cancel out enough interference so that both stations fall within the *de minimis* interference benchmarks.
- Maximization of DTV stations that use excessive tilting can be adequately analyzed within the Commission's other rules governing DTV maximization. *See* 47 C.F.R. 73.623(c). In anticipation of the Commission's first two-year review of its DTV allotment rules, Fox thus suggests that the Commission seek comment on whether Section 73.622(f)(4) of the Commission's rules should be deleted. In the alternative, Fox suggests that the Commission could avoid the unwarranted application of the excessive beam tilt rule, 47 C.F.R. § 73.622(f)(4), through the judicious use of waivers.

Processing Rules

The Commission's rules allow television stations to "maximize" or increase their service areas by operating with additional power or higher antennas than specified in the DTV Table of Allotments provided that such maximization causes no new interference to other stations (other than those small changes permitted under 47 C.F.R. § 73.622(f)(1), (2), and (3)). As the Commission has announced, all DTV maximization applications are placed on public notice and interested parties

have 30 days to file objections.¹ As explained below, the better reading of existing Commission rules is that DTV maximization applications and subsequently filed analog and digital minor modification applications will be processed and granted on a "first come/first served" basis.

Analog Applications Relative to DTV

Following the development of the table of digital television allocations, the Commission announced that it would consider any impact on DTV allotments in deciding whether to grant modifications of existing analog facilities.² The Commission later clarified that it would permit analog stations to upgrade to maximum authorized facilities only when such maximization would not conflict with digital allotments.³ The Commission stated that analog applications that are predicted to cause additional interference to DTV allotments or authorized DTV service will be dismissed.⁴ In contrast, DTV modifications may still be granted even if they cause an increase in interference to an existing or authorized analog or digital station as long as such increased interference does not exceed a *de minimis* level.⁵ Thus, in a situation where a digital modification and an analog modification would each create

¹ See *Advanced Television Systems and Their Impact upon the Existing Television Broadcast Service*, Second Memorandum Opinion and Order on Reconsideration of the Fifth and Sixth Report and Orders, FCC 98-315, para. 49 (rel. Dec. 18, 1998).

² *Advanced Television Systems and Their Impact on Existing Television Broadcast Service*, 12 FCC Rcd 14588, 14640, para. 113 (1997) ("DTV Sixth Report and Order"); see also Public Notice, Additional Application Processing Guidelines for Digital Television," Aug. 10, 1998, at 11.

³ *Advanced Television Systems and Their Impact on Existing Television Broadcast Service*, 13 FCC Rcd 7418, 7473, para. 137 (1998) ("DTV Sixth MO&O").

⁴ Public Notice, "Additional Application Processing Guidelines for Digital Television," Aug. 10, 1998, at 11.

⁵ *DTV Sixth MO&O*, 13 FCC Rcd at 7450-51, para. 80.

a *de minimis* amount of interference with existing facilities if granted, the digital application should be granted and the analog application should be dismissed. Outside of this limited situation, digital and analog modifications are both subject to the same processing rules for minor TV modifications.⁶

Treatment of Conflicting Minor Applications

Consistent with the observations of Mr. Wetmore concerning the difficulty of evaluating applications on any other basis, the better reading of the Commission's rules with regard to the processing of minor modification applications is that applications should be considered on a first come/first served basis. Section 73.3572(f) of the Commission's rules states that applications for minor modifications for television broadcast stations "may be filed at any time and, generally, will be processed in the order in which they are tendered." 47 C.F.R. § 73.3572(f). Section 73.3564(e) goes even further in stating that such minor modification "applications will be processed on a 'first come/first served' basis and will be treated as simultaneously tendered if filed on the same day." 47 C.F.R. § 73.3564(e).

Section 73.3591, however, states that in the case of applications for authorizations other than licenses to cover construction permits, the Commission will make grants if it finds no pending mutually exclusive application that was complete and tendered for filing by the "close of business on the day preceding the day designated by Public Notice as the day the listed application is to be available and ready for processing." 47 C.F.R. § 73.3591. Although this rule would seem to apply to minor modifications, Section 73.3564(c) provides that the Commission will issue public notices of all "long form applications . . . [and] such notice shall establish a cut-off date for the filing of petitions to deny." 47 C.F.R. § 73.3564(c). Under Section 309(c) of the Communications Act, petition to deny procedures do not apply to an application for a minor change in the facilities of an authorized station. *See* 47 U.S.C. § 309(c). Thus, based on a reasonable reading of the Commission's rules, an earlier filed digital application should be processed independently of and prior to the analog station's application.

⁶ Public Notice, "Commission Details Application Filing Procedures for Digital Television," Oct. 16, 1997.

When implementing the Congressionally mandated system of competitive bidding, the Commission indicated that in rare instances, two or more television applications can be mutually exclusive, and in such cases it would expect the parties to use engineering solutions and negotiations to resolve the mutual exclusivities.⁷ The Commission stated that "[m]inor modification applications will continue to be governed by first come/first served processing procedures, whereby priority rights are determined by the filing date of the minor modification application and such filing will cut-off the filing rights of all subsequent applicants."⁸ In a footnote to the succeeding sentence, however, the Commission stated that currently television "minor modification applications can become mutually exclusive until grant by the filing of a conflicting application."⁹

Notwithstanding this footnote in the *Auction Order*, under the Commission's rules, the only way such mutual exclusivity could occur is (1) when the applications were filed on the same day (which would support the Commission's description of the occurrence as a "rare instance"¹⁰), or (2) when the second application is filed during a cut-off period specified by public notice. The Commission's rules thus appear to indicate that an earlier filed DTV maximization application should be processed as first in line. Upon grant of an earlier filed DTV maximization application, the subsequently filed analog or DTV minor modification application should be dismissed or else granted subject to additional interference.

* * *

⁷ *Implementation of Section 309(j) of the Communications Act*, 13 FCC Rcd 15920, 15989-90, para. 178 (1998) ("*Auction Order*").

⁸ *Id.* at 15928, 15989, paras. 19, 177.

⁹ *Id.* at n.204. The footnote refers to paragraphs 180-183 of the *Auction Order* "for a discussion of cut-off rules," but those paragraphs do not apply to minor television modification applications.


¹⁰ *See id.*, para. 178.

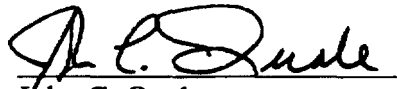
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We hope that the foregoing will be helpful as you consider the backlog of pending DTV applications. If you have additional questions, please do not hesitate to contact us.

Respectfully submitted,

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DTV Maximization Applications Processing Issues

1. Introduction

Maximization means any power or height increase for a DTV station beyond that given in the Table of Allotments (other than those small changes allowed for in Section 73.622(f)(1), (2), and (3)). Any power or height increase has the potential for causing interference. This means that any maximization must be evaluated whether it is for 200 kW, 1000 kW, or some other value. Power increases that use excess beam tilting (73.622(f)(4)) should also be considered maximizations and should have a full interference evaluation.

2. Chronology of Processing

Maximizations must be evaluated using the state of the spectrum as of the date of filing, not some future date long after the application is filed. This means that the Television Engineering Database must be culled prior to running *flr* (*flr* is the FCC Longley-Rice coverage and interference evaluation computer program.) to remove all grants and applications occurring after the DTV maximization filing date, the "Evaluation Date". This Evaluation Date will only be used for this one purpose.

Without the use of an Evaluation Date it is impossible to design DTV facilities which have a reasonable chance of being compliant. It is impossible for an engineer to know what the state of the spectrum will be months after his design is completed and filed.

3. Relationship Between NTSC and DTV Maximization Processing Rules

Certain specific priority must be given to DTV maximizations over NTSC applications. Specifically an NTSC application which would experience greater than *de minimis* interference as a result of a DTV maximization should only be granted with the understanding that it will experience greater than *de minimis* interference. Also in evaluating a DTV Maximization Application an NTSC application must not be considered mutually exclusive. We also feel that the current prohibition against NTSC facility changes causing any DTV interference is a wise one that should be re-emphasized.

4. Computational Tractability

The interference evaluation for a DTV maximization should only consist of four computer studies. The first study should be the establishment of a baseline using the most recent Application, CP, License, or Allotment (See Appendix A, Diagram 1). The second study should then be run with the only change being the proposed maximization. The third study is run using only the DTV facilities from the Table of Allotments and currently granted NTSC facilities (See Appendix A, Diagram 2). The fourth and final study is run with the only change from the previous run, being the proposed maximization.

Each of these four studies should treat all UHF stations operating at less than 200 kW (including stations that will cause masking) as if operating at 200 kW. This must be applied in *each* of the four studies, such that the only change between studies is the proposed maximization. From the analysis of the results of these four studies

along with the baseline figures from the Table of Allotments, both 2% and 10% *de minimis* determinations are made. See Appendix B.

The evaluation of interference “one station at a time” is computationally intractable, time-consuming at best, and does not shed material light on the state of interference between stations. The number of computer runs needed to evaluate interference one station at a time and in combination with other stations grows exponentially to the point where it is impractical. In addition if the various combinations of stations causing masking are considered, the number of computer runs increases at a frightening rate. Clearly looking at all combinations and permutations of stations’ facilities is neither desirable nor practical.

5. Protected Contour for Interference Analysis

An issue that needs clarification is what defines the protected contour for a television station. The FCC Rules, the *flr* computer program, and the *Additional Processing Guidelines for Digital Television (DTV)* are at odds with each other. 73.622(e)(2), which references OET-69, implies that the allotment Service contour is the protected contour as does the internal computer code within the *flr* program. The *Additional Processing Guidelines for Digital Television (DTV)* (dated August 10, 1998; see page 4 “Service area”), however, imply that the protected contour grows with a power/height increase over that in the Table of Allotments although this point is not explicitly stated.

The protected contour should be the frequency-adjusted Service (for DTV) or Grade B (for NTSC) contour per OET-69 used in the Table of Allotments. In other words the protected contour does not grow with a power/height increase. A station is

only protected within its original 6th R&O contour. We believe that this is a manageable, fair methodology that allows for maximization without an unreasonable growth in complexity. This must, of course, apply to analysis of stations whose power has been increased by the 200 kW Rule (see *The Additional Processing Guidelines for Digital Television (DTV)*) as well as stations that have been granted new facilities. Also as the principal goal of maximization is not an expansion in service area, but rather an improvement in field strength within a station's service area, this approach, which is currently implemented by the *flr* program, is the correct one to use.

6. Comparable Power for Comparable Coverage

Section 73.622(f)(5) of the Commission's rules allows a station to maximize "...up to that needed to provide the same geographic coverage area as the largest station within their market..." The Commission should clarify the "geographic coverage area" for purposes of this rule means Service Area as defined in 73.622(e)(1).

Using the service contour area is a reasonable approach. The fact that the contour of the station used as the "largest station" may not be concentric with the proposed DTV contour is unavoidable and is not an important point as few transmitters are completely common sited. The "largest station" and the proposed facility service contours may not encompass exactly the same number of people; however, any differences will be small because stations are sited as close to the major population mass as possible with the population well within the service contour; any differences thus occur at the fringe areas which are lightly populated. The FCC has used the NTSC Grade B contour for many years with success, so there would seem no reason to discontinue this useful, practical solution in DTV as expressed by the DTV Service Contour.

7. Mutually Exclusive DTV Applications

Mutually exclusive DTV applications should be evaluated with both stations maximized. Often in this case the increased power of both stations cancels out enough interference so that both stations pass *de minimis* muster. Running seemingly mutually exclusive applications simultaneously may save considerable time and conserve scarce Commission resources that would otherwise be expended during the administrative procedures which would be invoked if one or both applications were rejected. In addition, this approach is consistent with the FCC's policy to encourage maximization of DTV stations and thus speed the transition to digital television.

If chronological processing of applications is not used, we feel that where DTV mutually exclusive applications occur, each application should receive some form of preliminary engineering evaluation to ascertain whether it has a reasonable chance of being compliant. We are concerned that as the window for DTV maximization closes, there will be spurious, "place holder" applications filed which could block *bona fide* applications. We want to be sure that valid applications are evaluated in a reasonable environment. Indeed, this risk of spurious applications is yet another reason why the FCC should process DTV maximization applications on a "first come/first served" basis.

8. Maximizations Involving "Over-Tilting"

Changes are also needed in Section 73.622(f)(4) which deals with maximizations using excessive beam tilt. Currently beam tilt in excess of 1 degree

invokes this section, which creates two problems. First, many transmitter sites are quite high and require greater than 1 degree of beam tilt for their normal configuration. Cities in this category include Denver, Los Angeles, Albuquerque, and Colorado Springs, among others. Secondly the rules are not clear on the use of tilt only at certain azimuths. This case often arises from the use of mechanical tilt which may depress the main beam below one degree only at certain azimuths.

We believe this section can and should be removed. Maximizations which use excessive tilting can be adequately analyzed within the other rules, *i.e.*, 73.622(f)(5), 73.623(c)(2), and 73.623(g). In our view there is no reasonable way to define what constitutes over-tilting as opposed to mechanical and/or electrical tilt that is used for coverage and/or interference avoidance at various azimuths.

Submitted by



R. Evans Wetmore, P.E.,
VP, Advanced Engineering
News Technology Group



This appendix describes the method of culling the FCC Engineering Database into a temporary databases which are suitable for running *flr*. These temporary databases will each have one and only one entry for each station.

Culling Methodology

This culling process is first done using the “Culling Rules” outlined in Diagram 1. The temporary database generated by these rules will be used in the first two *flr* runs and will generate the first two result files.

The culling process is then done again using the second set of “Culling Rules” outlined in Diagram 2. Similarly, the temporary database generated by these rules will be used for the next two *flr* runs, and will generate the next and last two result files.

Culling Rules

First all database entries which are later than the “Evaluation Date” of the application being considered are removed. Second, culling is done based on status. Our “Culling Rules” describe the priority we believe entries in the database should have.

These rules are different for NTSC and DTV database entries. For NTSC, highest priority goes to the most recent CP MOD, then to the most recent CP and lastly to a License. No status is given to Applications. These NTSC rules are the same for both sets of “Culling Rules”, as depicted in Diagrams 1 and 2.

For DTV stations, two different sets of Culling Rules are used. The first set as described in Diagram 1, places the highest priority on the most recent Application, followed by the most recent CP MOD, CP, and then License. Lastly, if none of those are present, the original allotment will be used. In the second set of Culling rules as depicted in Diagram 2, the DTV allotment is chosen whether or not any Applications, CP's or licensed changes exist.

DIAGRAM 1

(Includes DTV Apps/CP/LIC)

TV ENGINEERING DATABASE

KXXX-TV	LICENSE	5/11/95
KXXX-TV	CP	6/16/97
KXXX-TV	CP MOD	7/13/98
KXXX-TV	CP MOD	8/12/99

KXXX-DT	ALLOT	NONE
KXXX-DT	CP	7/15/98
KXXX-DT	APP	8/09/98
KXXX-DT	CP MOD	9/12/99

TEMPORARY FLR DATABASE

KXXX-TV	CP MOD	8/12/99
---------	--------	---------

KXXX-DT	APP	8/09/98
---------	-----	---------

EVALUATION
DATE

DATE
FILTER

CULLING
PROGRAM

CULLING RULES
(IN ORDER OF PRIORITY)

NTSC

1. MOST RECENT CP MOD
2. MOST RECENT CP
3. LICENSE

DTV

1. APPLICATION
2. MOST RECENT CP MOD
3. MOST RECENT CP
4. LICENSE
5. ALLOTMENT

DIAGRAM 2
(Includes DTV Allotment Only)

TV ENGINEERING DATABASE

KXXX-TV	LICENSE	5/11/95
KXXX-TV	CP	6/16/97
KXXX-TV	CP MOD	7/13/98
KXXX-TV	CP MOD	8/12/99

KXXX-DT	ALLOT	NONE
KXXX-DT	CP	7/15/98
KXXX-DT	APP	8/09/98
KXXX-DT	CP MOD	9/12/99

TEMPORARY FLR DATABASE

KXXX-TV	CP MOD	8/12/99
---------	--------	---------

KXXX-DT	ALLOT	NONE
---------	-------	------

**EVALUATION
DATE**

**DATE
FILTER**

**CULLING
PROGRAM**

CULLING RULES

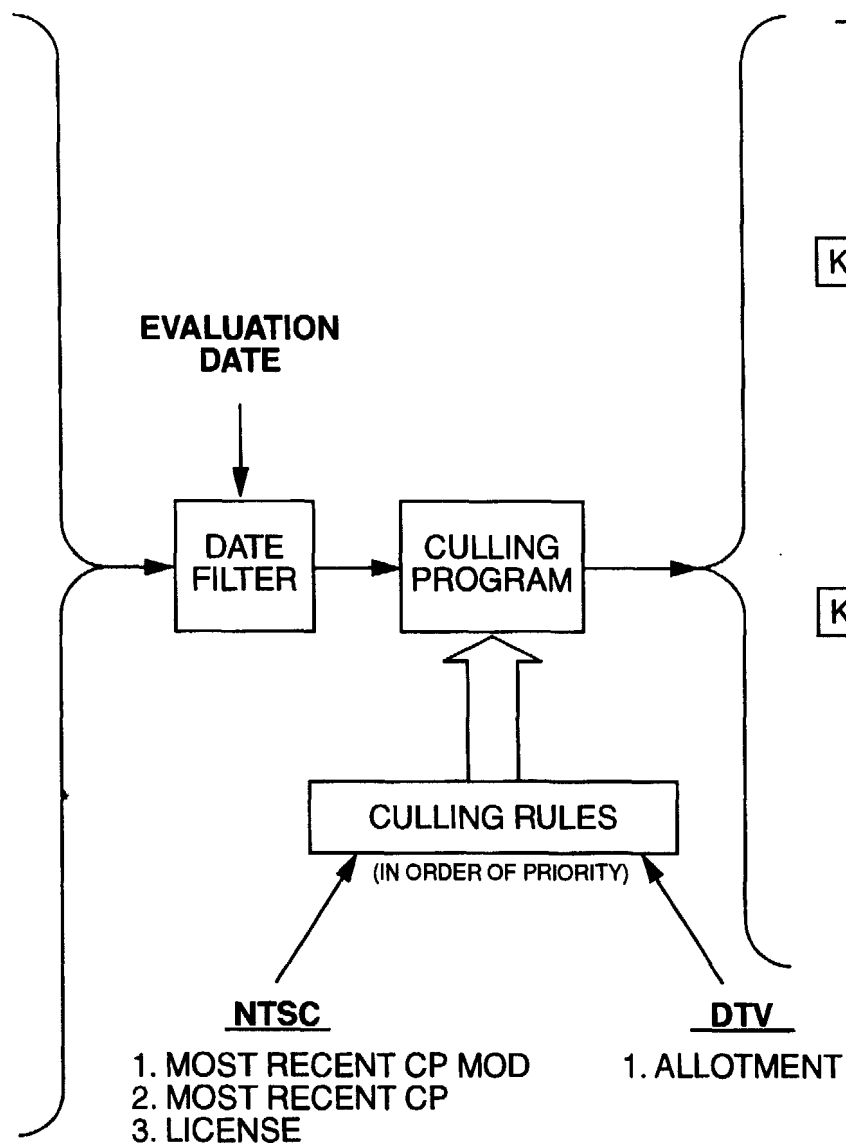
(IN ORDER OF PRIORITY)

NTSC

1. MOST RECENT CP MOD
2. MOST RECENT CP
3. LICENSE

DTV

1. ALLOTMENT



Pseudo-Code Invocation

This section provides example pseudo-code which will determine whether or not a particular proposal satisfies the 2% and 10% *de minimis* criteria. The input for this pseudo-code is the Table of Allotments and a pair of result files: before and after the proposed change. Since there are four result files, this pseudo-code will be run twice, once with the first two result files, and again with the third and fourth result files. If the pseudo-code fails on either of these two invocations, the application shall be considered non-*de minimis*.

If no relevant DTV stations have applied for changes, then only two result files will be produced, and this pseudo-code need only be run once.

Pseudo-Code Notation

The two result files representing coverage before and after the proposed change will be respectively referred to as "1" and "2". Pseudo-code variable names have been associated with the various lines present in the result file. Thus, the pseudo code may contain the entry `Terrain[2]` which refers to the population "Not affected by terrain losses" in result file "2".

Sample NTSC "Result File" Entry

Analysis of: 25N CO LONGMONT			
	POPULATION	AREA (sq km)	
within Noise Limited Contour	2169834	18953.8	→ "Total"
not affected by terrain losses	2144773	17874.7	→ "Terrain"
lost to NTSC IX	367	104.7	→ "NTSCIX"
lost to additional IX by ATV	1274	32.2	→ "Additional"
lost to all IX	1641	136.9	→ "All"

Pseudo Code Variables

Pseudo Code for NTSC *de minimis* Determination

```

BASE_LINE      = Total[1]
NEW_INT        = All[2] - All[1]
PERCENT_NEW    = 100 * NEW_INT / BASE_LINE
PERCENTLOSS    = 100 * Additional[2] / BASE_LINE

```

```

Fail if (PERCENTLOSS ≥ 10.05 and
        PERCENT_NEW ≥ 0.05)

```

```

Fail if (PERCENT_NEW ≥ 2.05)

```

Sample DTV "Result File" Entry

Analysis of: 29A CO LONGMONT
 HAAT 325.0 m, ATV ERP 234.1 kW

	POPULATION	AREA (sq km)
within Noise Limited Contour	2169834	18953.8
not affected by terrain losses	2149611	18068.0
lost to NTSC IX	0	0.0
lost to additional IX by ATV	1734	277.8
lost to ATV IX only	1734	277.8
lost to all IX	1734	277.8
percent match ATV/NTSC	100.0	99.4

→ "Total"
 → "Terrain"
 → "NTSCIX"
 → "Additional"
 → "ATV"
 → "All"

Pseudo Code Variables

Pseudo Code for DTV *de minimis* Determination

```
NEW_INT           = All[2]      - All[1]
DTV_SERVICE       = Terrain[1] - All[1]
DTV_SERVICE_FINAL = Terrain[2] - All[2]
```

```
POP_N = "NTSC Population" from Table of Allotments
POP_D = "DTV Population" from Table of Allotments
```

```
BASE_LINE_2 = Greater of: POP_N and DTV_SERVICE
BASE_LINE_10 = Greater of: POP_N and POP_D
```

```
FINAL_SERVICE_RATIO = DTV_SERVICE_FINAL / BASE_LINE_10
PERCENT_NEW_DTV      = 100 * NEW_INT / BASE_LINE_2
```

```
Fail if (FINAL_SERVICE_RATIO ≤ 0.9 and
        PERCENT_NEW_DTV      ≥ 0.05)
```

```
Fail if (PERCENT_NEW_DTV ≥ 2.05)
```